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10/785,278

02/24/2004

Yun Luo

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EXAMINER

DESIRE, GREGORY M

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

08/30/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/785,278

Applicant(s)

LUO ET AL.

Examiner

Gregory M. Desire

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-21 and 23-28 is/are rejected.
- 7) ☒ Claim(s) 2,13 and 22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 2/24/06 & 8/10/06.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-12, 14-21 and 23-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Baloch et al (6,459,974).

Regarding claims 1, 12 and 21

A plurality of pattern recognition classifiers (note fig. 4, classifier 1, 2, 3, 4...n), each of the plurality of pattern recognition classifiers determining a candidate output class and at least one rejected output class for the input image from an associated subset of the plurality of output classes (note fig. 4 block 48 and col. 9 lines 34-36) and generating a confidence value associated with the classifier based on the determination (note fig. 4 block 50 and col. 9 lines 39-41); and

An arbitrator that selects a classifier having the best associated confidence value and eliminates the at least one rejected class determined at the selected classifier from consideration as the associated class for the input image (note col. 12 lines 47-50).

Regarding claim 3,

Wherein the subset of output classes associated with each classifier comprises two classes, such that each classifier determines one candidate class and one rejected

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class (note fig. 4, block 48 and 50).

Regarding claim 4,

Wherein at least one of the pluralities of pattern recognition classifiers includes a support vector machine (fig. 4, block 42).

Regarding 5,

Wherein at least one of the pluralities of pattern recognition classifiers includes an artificial neural network (note fig. 4, block 52, expert system).

Regarding claim 6,

An image source that provides the input image (note fig. 4, 36 and 38).

Regarding claim 7,

Wherein the image source is operative to provide the input image as a three-dimensional image (note col. 5 lines 32-34).

Regarding claim 8,

Wherein the image source includes a stereo camera (note col. 5 lines 43-46).

Regarding claim 9,

Wherein the image source is operative to provide the input image as a two-dimensional image (note col. 5 lines 32-34).

Regarding claim 10,

An image preprocessor that removes background information and noise from the input image (note col. 5 lines 39-41).

Regarding claim 11,

Image preprocessor applying a contrast limited adaptive histogram equalization that adjusts the input image for lighting conditions (note fig. 2 ambient image and computer system).

Regarding claim 14,

Wherein the candidate class determined by the one remaining classifier is accepted as the output class associated with the input image, and the accepted class is provided as an input to the vehicle occupant safety system (note col. 8 lines 52-54).

Regarding claim 15,

Wherein at least one of the plurality of output classes represents a human adult seated within the vehicle interior (note col. 8 lines 46-49, classification type adult).

Regarding claim 16,

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Wherein at least one of the pluralities of output classes represents a rearward facing infant seat positioned within the vehicle interior (note col. 8 line 51, classification type rear facing infant).

Regarding claim 17,

Wherein at least one of the pluralities of output classes represents a human head (note col. 8 line 55, classification type miscellaneous).

Regarding claim 18,

Wherein the vision system is operative to produce a two-dimensional image of the vehicle interior (note fig. 2 and col. 5 line 32-35).

Regarding claim 19,

Wherein the vision system is operative to produce a three-dimensional image of the vehicle interior (col. 5 lines 32-35).

Regarding claim 20,

Wherein the vision system-comprises a stereo camera that images the vehicle interior as a stereo disparity map (note col. 5 lines 32-35 and 43-46).

Regarding claim 23

Accepting the one remaining output class as the associated output class for the input image, and providing the accepted output class to a vehicle occupant safety system (note col. 8 lines 52-54).

Regarding claim 24,

Extracting feature data from the input image and providing the extracted feature data to the plurality of classifiers (note fig. 4, block 40).

Regarding claim 25,

Wherein extracting feature data from the input image includes extracting at least one feature value from at least one region of interest within the image (note col. 6 lines 13-16).

Regarding claim 26,

Wherein the at least one feature value includes an average grayscale value associated with each region of interest (col. 6 lines 15-25).

Regarding claim 27,

Wherein the at least one feature value includes a coarseness measure associated with each region of interest (col. 6 lines 15-25).

Regarding claim 28,

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Wherein the at least one feature value includes a contrast measure associated with each region of interest (col. 6 lines 15-25).

***Allowable Subject Matter***

3. Claims 2, 13 and 22 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory M. Desire whose telephone number is (571) 272-7449. The examiner can normally be reached on M-F (6:30-3:00).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eileen Lillis can be reached on (571) 272-6928. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

G.D.  
August 28, 2007

  
GREGORY DESIRE  
PRIMARY EXAMINER